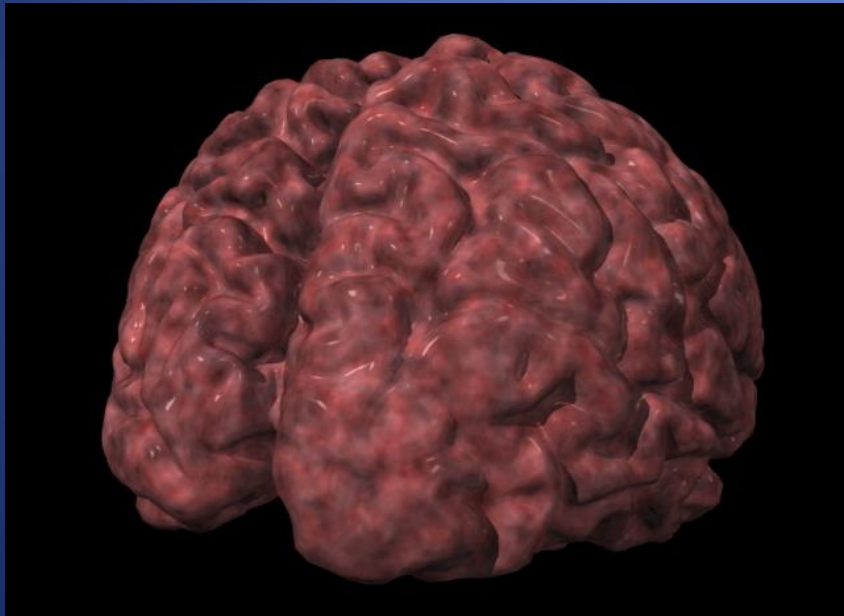


Substance Use Disorder “Addiction”

A Chronic Brain Disease



What you will Learn

- Addiction is a Brain Disease
 - Understand the Structure and Pathways Associated with changes in the brain.
- Addiction is a Chronic Condition
 - Recognize the similarities of addiction and other Chronic Conditions
- Addiction is Treatable & Preventable
 - Identify current recommendations for management of addiction as a chronic disease.
 - Prevent future health consequences by making healthy lifestyle choices.

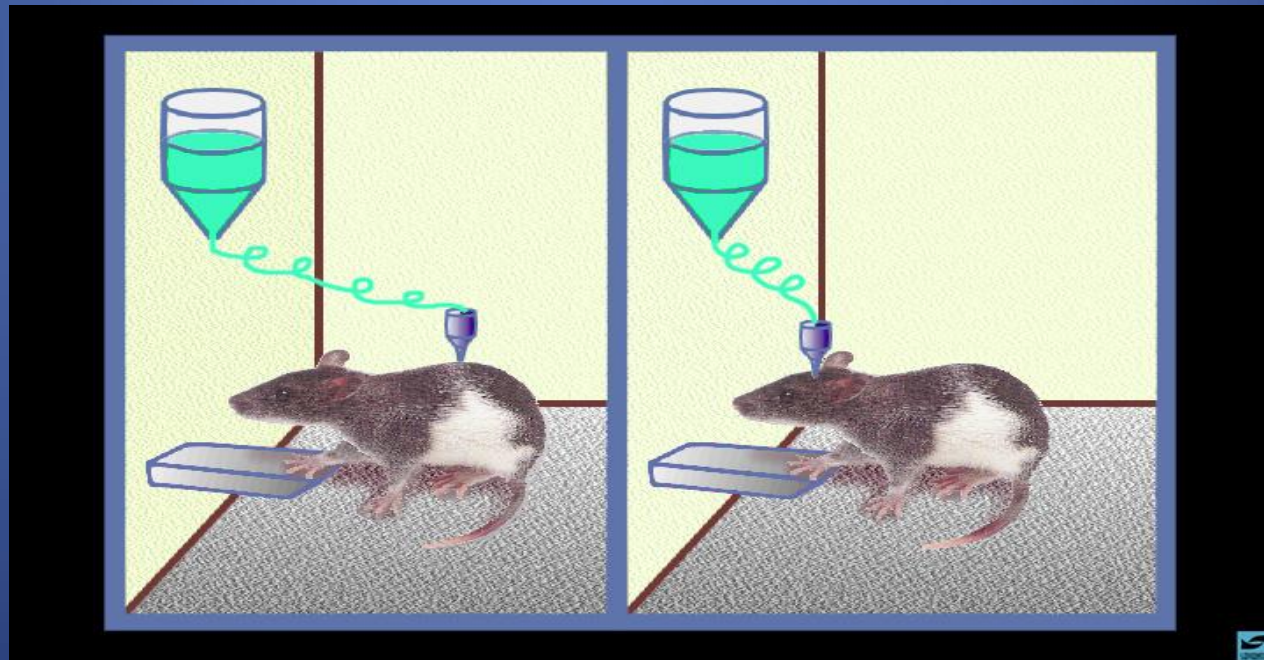
Myths & Misconceptions

- A person addicted to drugs / alcohol is
 - Bad, crazy, simply stupid
 - Lacking willpower
 - Hopeless
 - Must be punished as a means to force them to change
 - Must reach bottom before they can get help



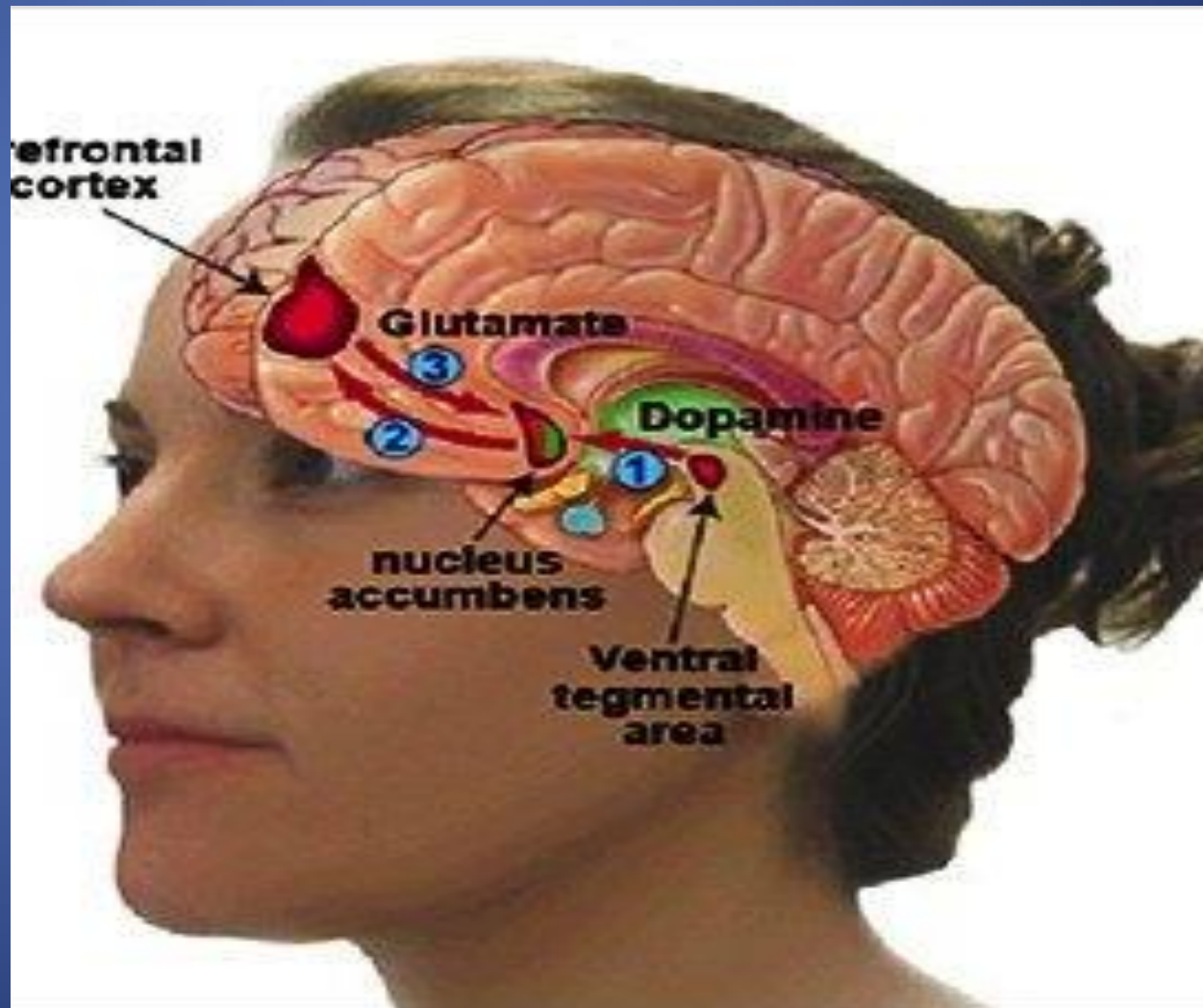
Understanding Drug Abuse and Addiction

What Science Says



A Complex Illness

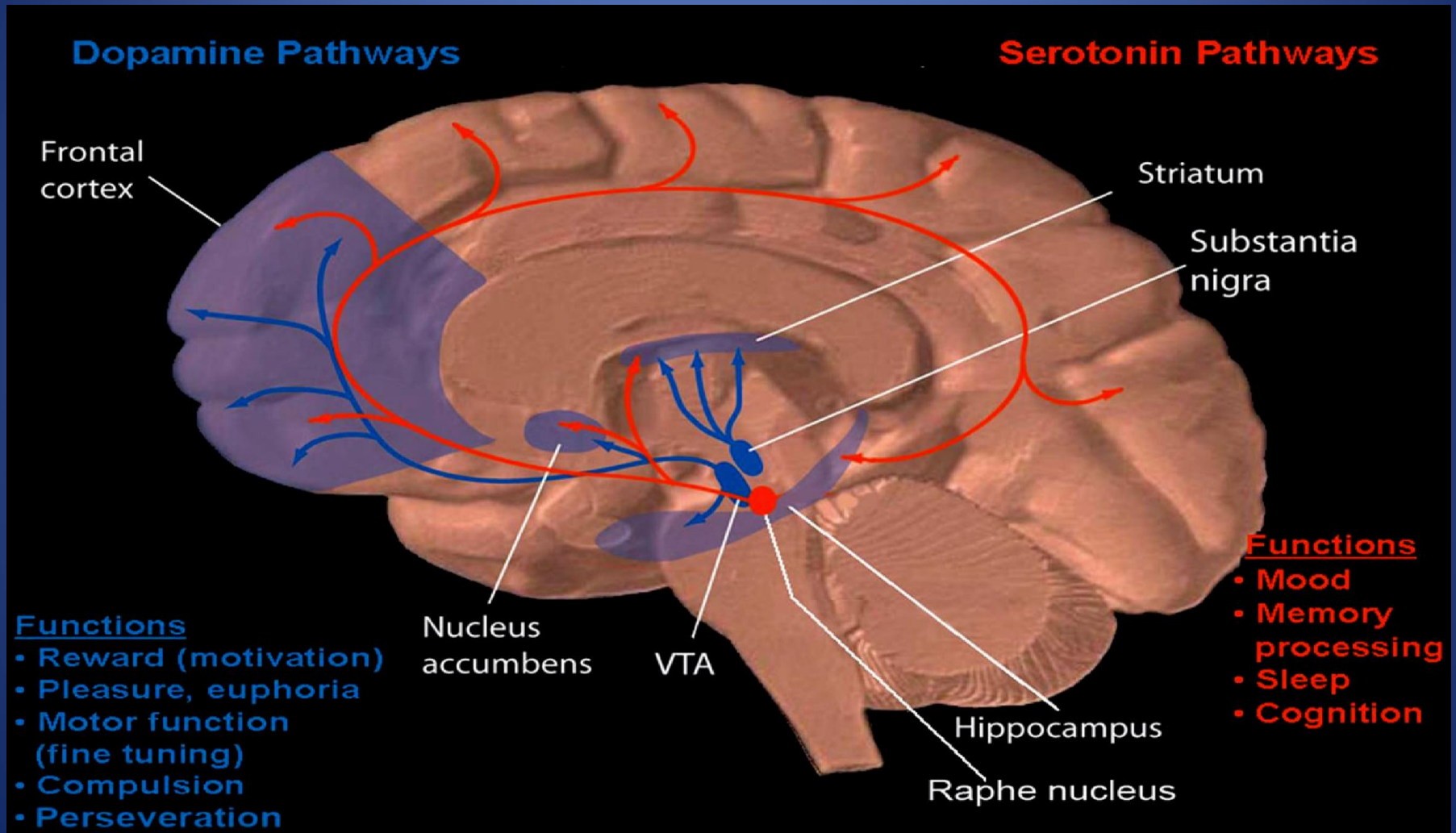
- Reward Pathways
- Emotional Centers
- Memory Centers
- Perceptions & Judgments



Changes in the Brain

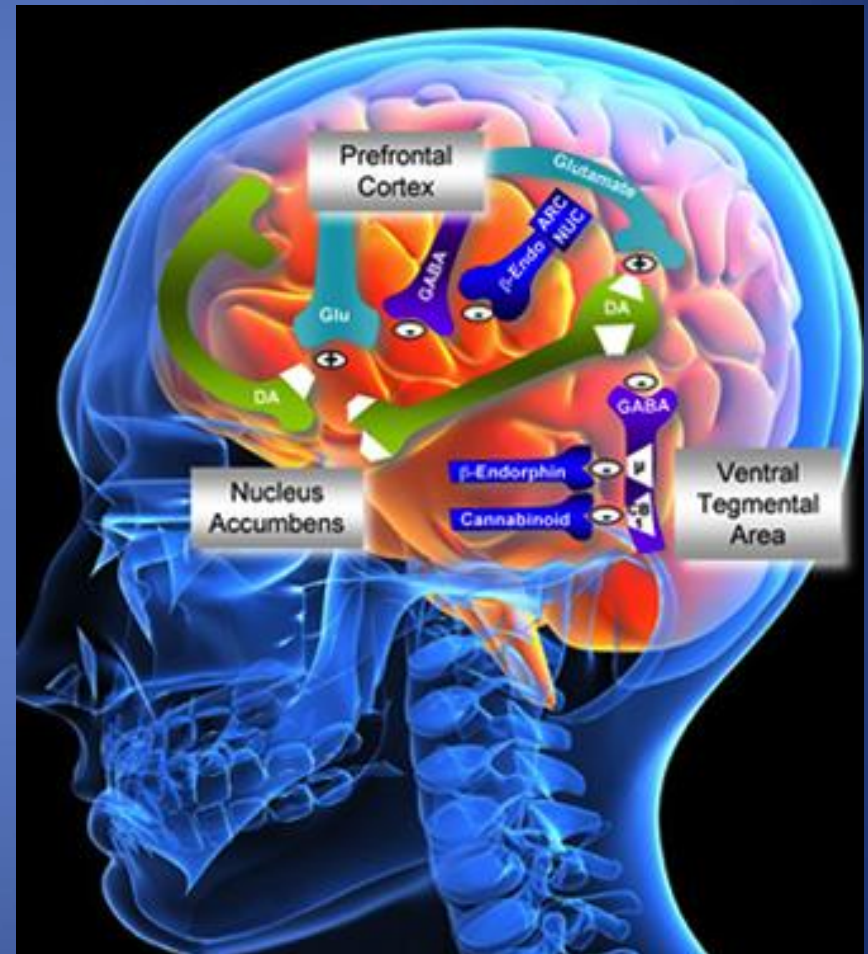
- Over Time Addiction causes changes in the brain.
 - Brain Structure
 - Prefrontal Cortex, limbic system
 - Brain Pathways (neural connections)
 - Dopamine pathway, serotonin pathway
 - Brain Chemicals
 - Dopamine, serotonin, endorphin, glutamate

Brain Pathways



Brain Chemicals

- Dopamine – a feel good chemical.
- Serotonin – the happy, anti-worry, flexibility chemical.
- GABA – an inhibitory neurotransmitter that helps calm or relax the brain
- Endorphins – the brains own natural pleasure and pain killing chemical
- Glutamate – locks the pleasurable experience into memory



The Addict's Dilemma

- The brain is hard wired to seek rewards ... food, water, sex (for survival)
- Addictive drugs activate this same reward pathway creating Powerful desires that mimic survival needs.
- Psyche – automatically seeks refuge from STRESS / PAIN -
- Prefrontal Cortex (judgment & decision making) – tells the addict to stop ... bad things are happening ...
- Limbic System (pleasure / reward/survival) system override those commands with uncontrollable cravings and a compulsive drive to seek rewards and refuge from stress/pain.

The Pathology of Addiction

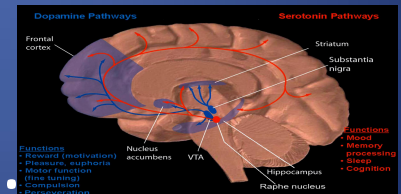


THE
PATHOLOGY
OF
ADDICTION

Based on The Craving Brain by Dr. Ronald R. Ruden

The Addiction Cycle & the 4 C's

- Craving (dopamine; brain is hard wired to crave rewards)
- Compulsion (low serotonin levels)
- Loss of Control (damage to the prefrontal cortex; right & wrong)
- Continued Use Despite Consequences – further damage to prefrontal cortex (interferes with judgement).



Predisposition & Progression

Substance Use

Substance Misuse / Substance Abuse



Substance Dependence / Addiction



Genetics / Environment

The Disease Model

- Only about 100 years old
- Emerged from Germ Theory
- Organ >>>> Defect >>>> Symptoms
 - Femur > Fracture > Pain/Deformity
 - Pancreas > Insulin Secretion > Symptoms of Diabetes
- Doctors go after the Defect to cure the disease.

Is addiction a Disease?

- Disease is a departure from health.
- Disease —” a disordered or incorrectly functioning organ, part, structure or system of the body.
- Defect (malady)
- Signs & Symptoms
- Predictable Natural Course
- Specific Outcome if left untreated
- Risk Factors
- Early Warning Signs
- Diagnostic Criteria

Signs & Symptoms

- Cravings
- Compulsion
- Loss of Control
- Continued use Despite Consequences
- Tolerance
 - A State in which an organism no longer responds to a drug
 - A higher dose is required to achieve the same effect.
- Withdrawal
 - Manifested as a physical disturbance when the drug is removed (withdrawal)

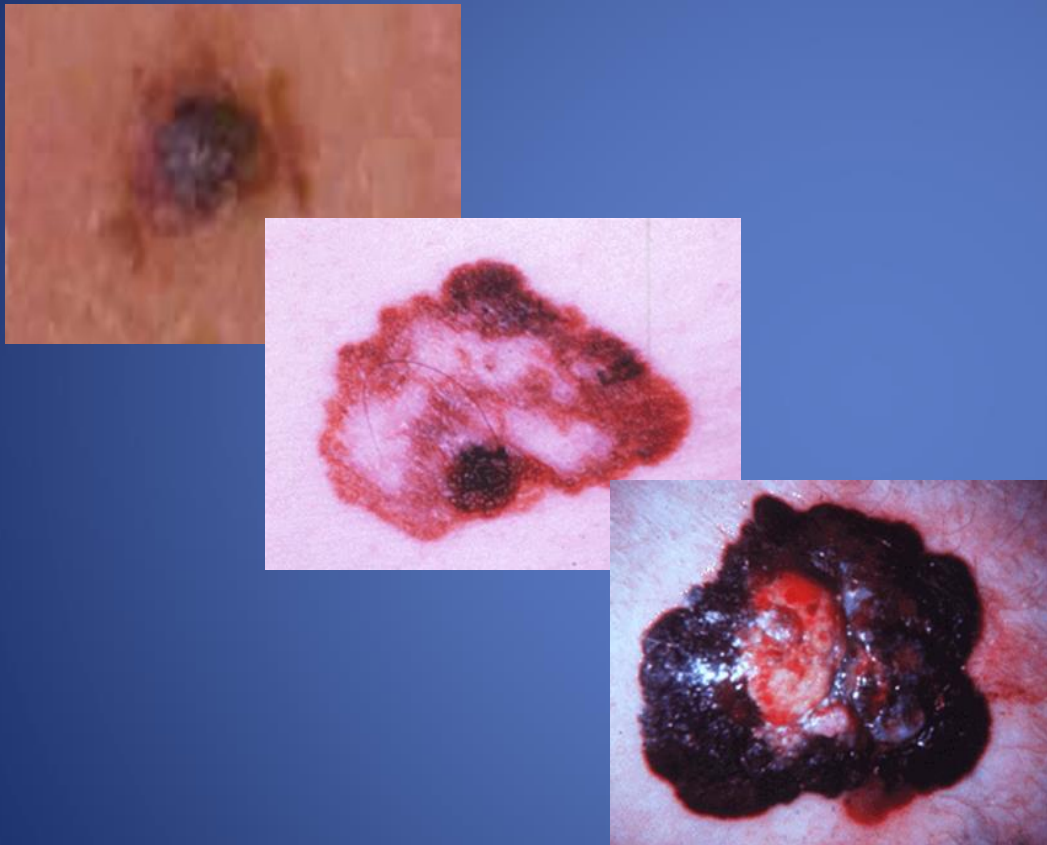
Addiction Progresses in Stages

- ◆ Substance use
- ◆ Substance Abuse (Risky Use)
- ◆ Substance Dependence / Addiction
- ◆ DSM IV makes a clear distinction between substance abuse / addiction; the pattern of compulsive use is the distinguishing factor.

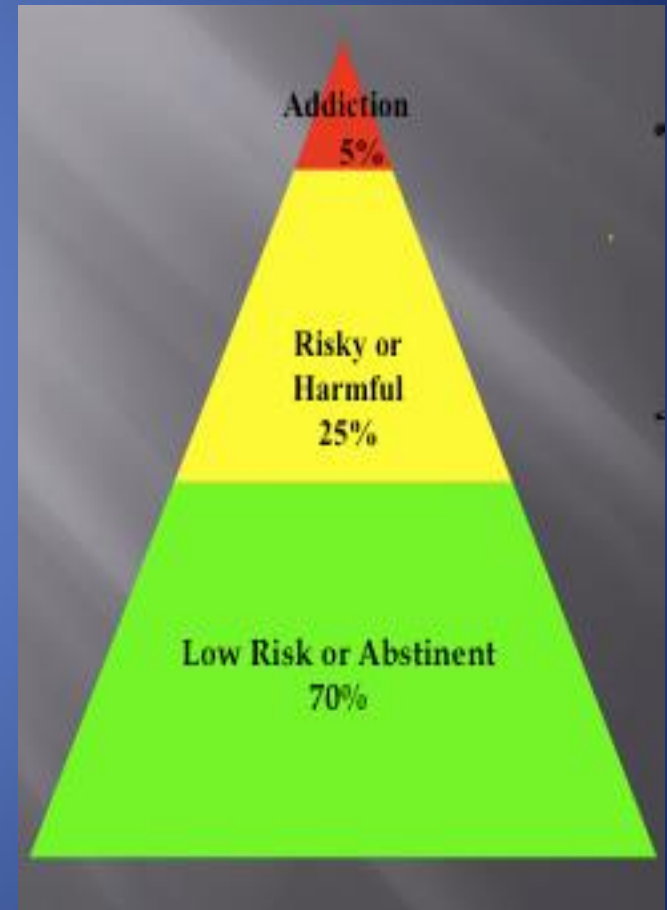


Predictable Natural Course

Addiction Progresses in Stages



Cancer Progresses in Stages



Substance Dependence as a Brain Disease

- Substance dependence: fundamentally, a brain disease
- Prolonged drug use changes the brain in fundamental and long-lasting ways
 - Both structural and functional
- Drugs change brain circuits and motivational priorities
 - More than simple pursuit of pleasure

Addiction

A chronic Progressive disease

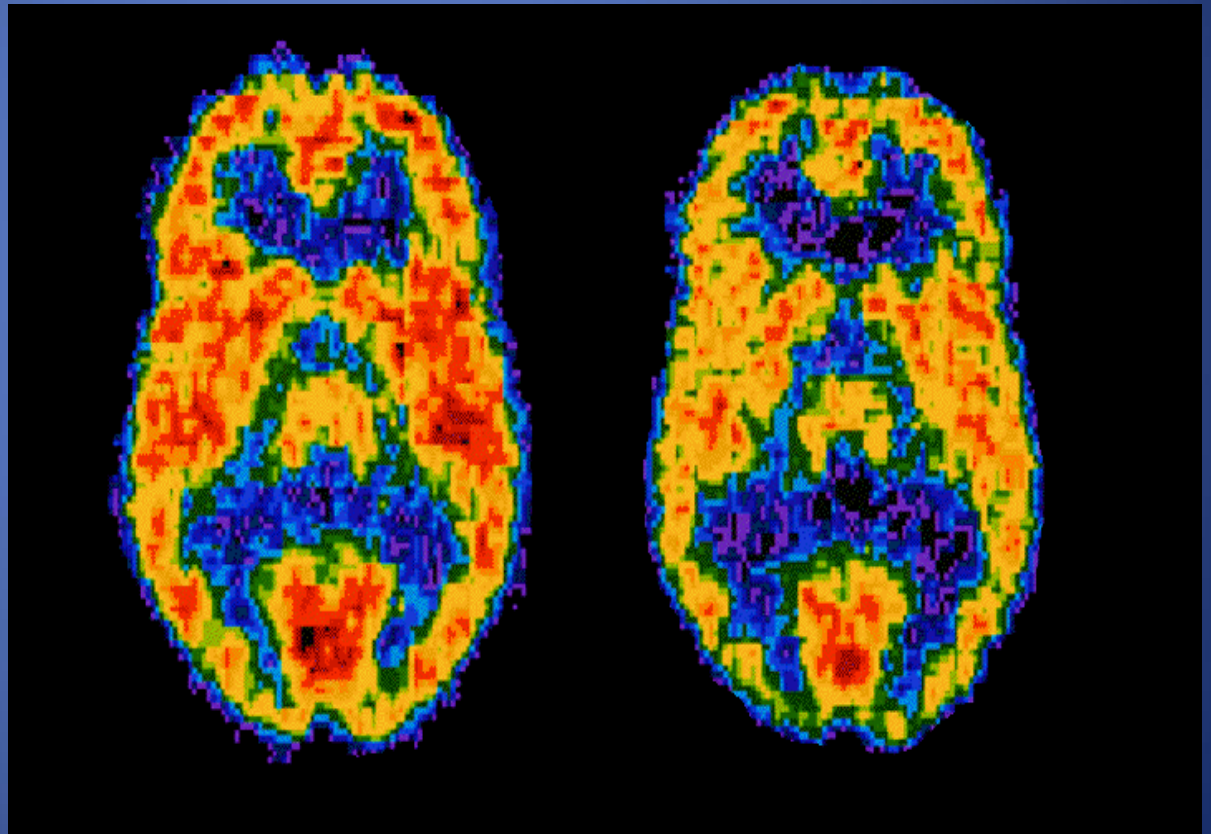
- Hypertension
- Type II Diabetes
- Atherosclerosis
- Asthma
- Obesity
- COPD
- Genetic Predisposition
- Environmental factors
- Social Factors
- Progressive over time
- Signs & Symptoms
- Structural / Functional malady (defect)
- Risk Factors
- Protective Factors

Positron Emission Tomography (PET)

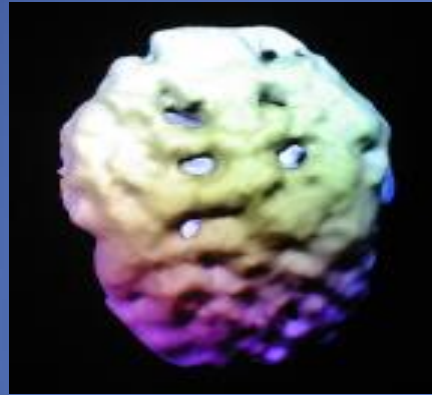


control

on cocaine

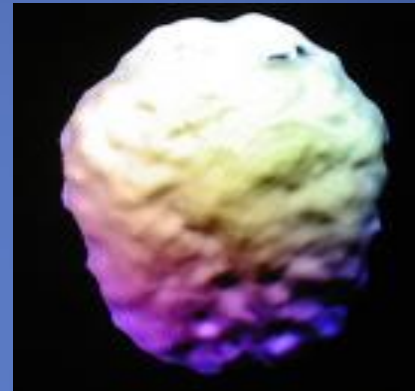


Medical science requires assessing the target organ in conjunction with the behavior. For addiction, the target organ is the brain



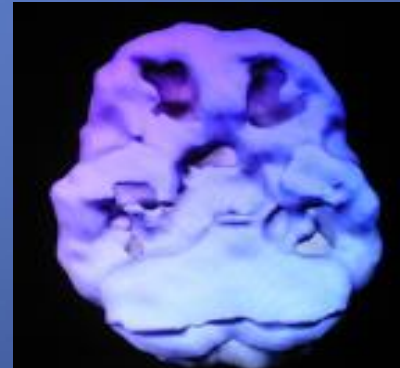
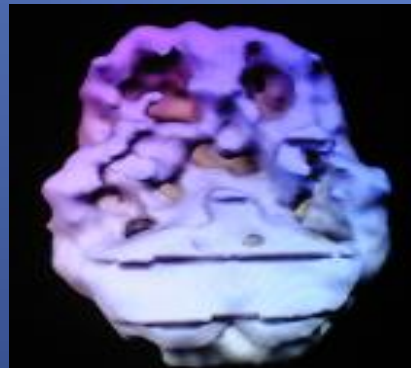
top down surface view

during substance abuse



top down surface view

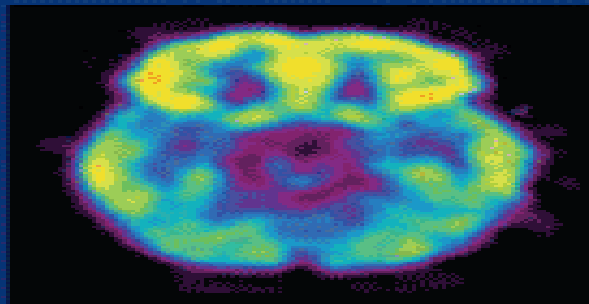
after a year drug and alcohol free



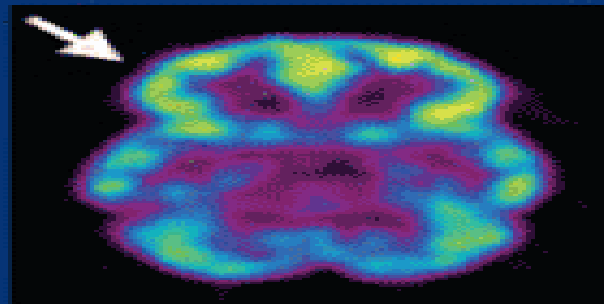
underside surface view

Brain Disease / Heart disease

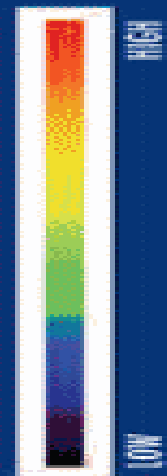
DECREASED BRAIN METABOLISM IN **DRUG ABUSER**



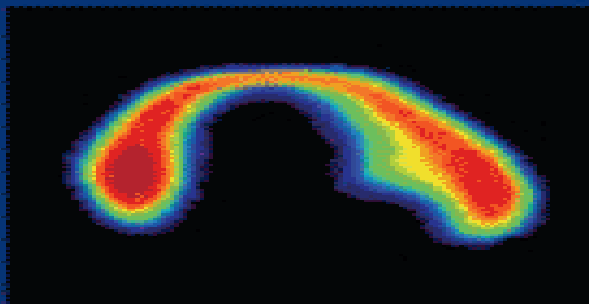
Healthy Brain



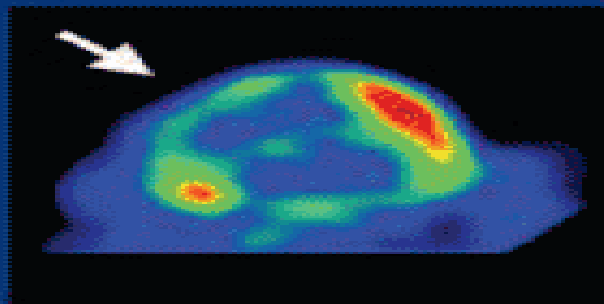
Diseased Brain/Cocaine Abuser



DECREASED HEART METABOLISM IN **HEART DISEASE PATIENT**



Healthy Heart



Diseased Heart

Risk Factors

General Risk Factors

1. Psychological
2. Behavioral
3. Social
4. Demographic
5. Family
6. Genetics

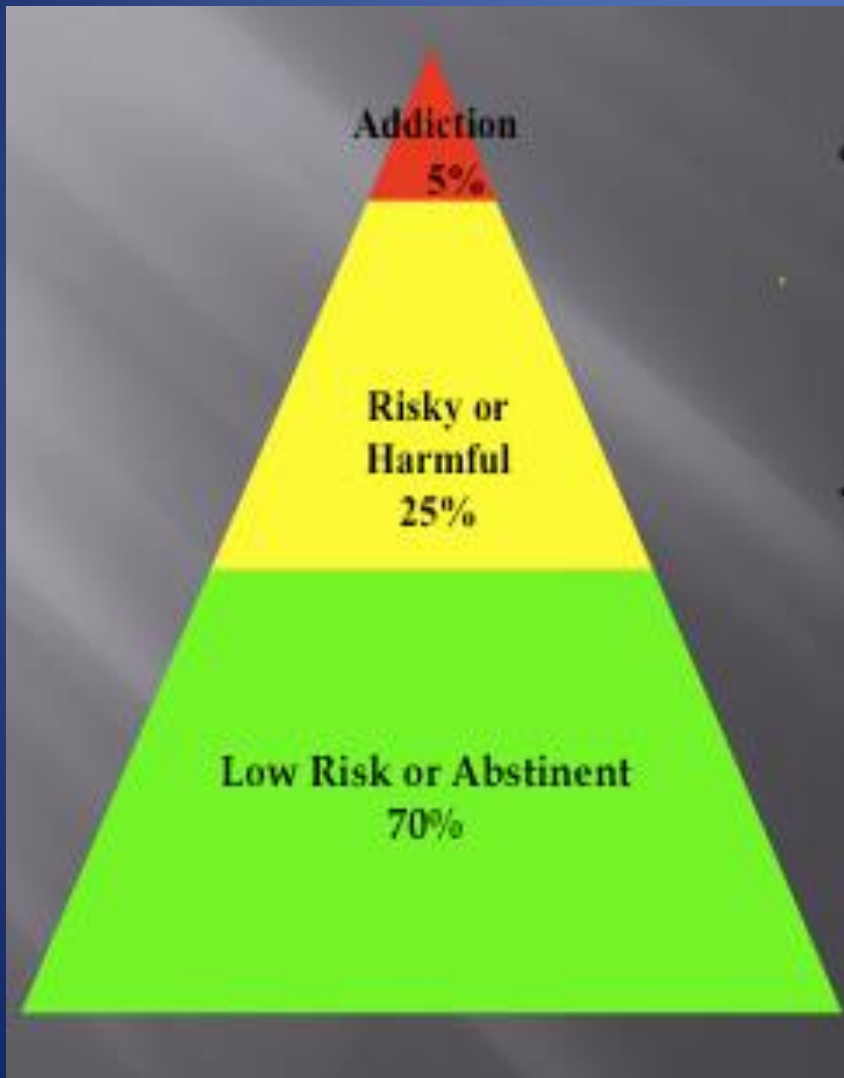
Stress and Addiction
are closely linked.

Increased stress
creates a significant
increase in risk for
addiction.

Protective Factors

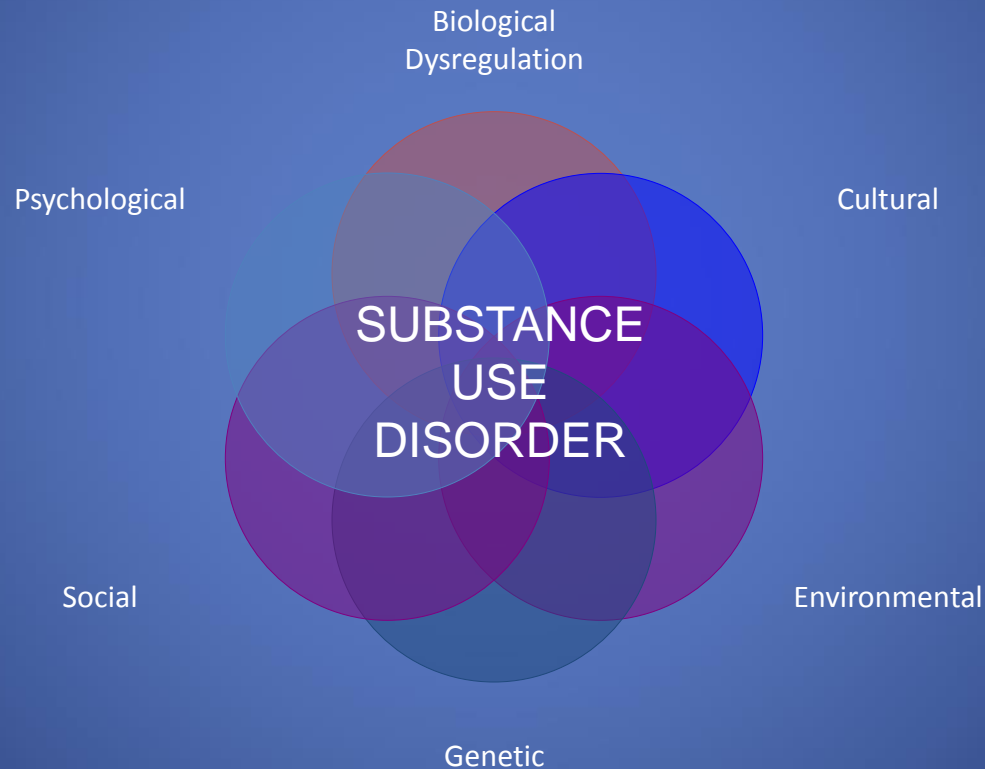
- Lifestyle Risk Reduction
 - Stress Reduction Activities
 - Exercise, Meditation, Yoga, Painting, Music
 - Healthy Lifestyle
 - Proper Nutrition, regular exercise
 - Healthy Relationships
 - Healthy emotional bonds with others
 - Healthy Work and Social Environments
 - Environments that support healthy living

Prevention / Treatment



- Early Screening and Intervention
- Lifestyle Changes
- Behavior modification
- Outpatient Therapy
- Inpatient Treatment
- Pharmacotherapy
 - Medication coupled with adjunctive lifestyle modifications can be of great therapeutic benefit in treating addiction

Etiology of Substance Dependence: A Multifactorial Neurologic Disorder



Thank You

Questions/Comments/Discussion

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